

Amendments to the Drawings:

The drawing sheet attached in connection with the above-identified application containing Figures 9A-9D are being presented as a new formal drawing sheet to be substituted for the previously submitted drawing sheet. Drawing Figures 9A-9D have been amended. Appended to this amendment is an annotated copy of the previous drawing sheet which has been marked to show changes presented in the replacement sheet of the drawing.

The specific changes which have been made to Figures 9A-9D are to add a substrate 200.

REMARKS

Applicants respectfully request reconsideration of the present application in view of the foregoing amendments and in view of the reasons that follow.

In the specification, paragraphs have been amended on pages 9, 11-14, and 16.

This amendment adds, changes and/or deletes claims in this application. A detailed listing of all claims that are, or were, in the application, irrespective of whether the claim(s) remain under examination in the application, is presented, with an appropriate defined status identifier.

After amending the claims as set forth above, claims 1 and 3-16 are now pending in this application. Claims 10-16 are withdrawn from consideration.

Objection to the Specification

The specification is objected to because the title is not descriptive, the related application information needs to be updated, and because trademarks are used in the specification. The specification has been amended to overcome these objections. Applicants note that there are currently no pending divisional applications or continuations of this application. Withdrawal of these objections is respectfully requested.

Objection to the Drawings

The drawings are objected to for not showing the semiconductor substrate recited in claim 1. Figures 9A-9D have been amended to show a substrate 200. Withdrawal of this objection is respectfully requested.

Rejections under 35 U.S.C. § 112

Claims 1-9 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. The drawings and claims have been amended to overcome these rejections. Withdrawal of these rejections is respectfully requested.

Rejections under 35 U.S.C. § 103

Claims 1, 3-6, 8 and 9 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,877,080 (hereafter “Aoi et al.”). This rejection is respectfully traversed.

Amended claim 1 recites a semiconductor device that includes a semiconductor substrate, “a first insulating film formed on an upper side of said semiconductor substrate, said first insulating film consisting essentially of ladder-shaped siloxane hydride,” and a second insulating film disposed adjacent to said first insulating film, said second insulating film containing oxygen and silicon as constituent elements. Claims 3-6, 8, and 9 depend upon claim 1.

Aoi et al. discloses a semiconductor device that includes a substrate 10, a first insulating film 12, an interlayer insulating film 13, and a second insulating film 14 composed of a silicon dioxide. See Aoi et al. at col. 19, lines 43-56, and Figs. 2(a)-2(d). Aoi et al. also discloses a semiconductor device that includes a substrate 20 and an interlayer insulating film 21. See Aoi et al. at col. 19, lines 63-67, and Figures 3(a)-3(d). Aoi et al. further discloses that an oxide film may be deposited on the interlayer insulating film 21. See Aoi et al. at col. 20, lines 15-23.

Aoi et al. discloses that the interlayer insulating film is made from a mixture of materials, such as ladder siloxane polymer mixed with silica or organic polymer. See Aoi et al. at col. 2, lines 2-34; col. 4, lines 1-23, 44-51; and col. 5, lines 37-60. Aoi et al. discloses that the siloxane polymer can have a hydrogen-silicon bond. See Aoi et al. col. 11, lines 18-24. Aoi et al. discloses that the interlayer insulating film mixtures provide improved properties over the properties for individual components of the mixture. See Aoi et al. at col. 4, lines 1-23, and col. 5, lines 37-60. Aoi et al. further teaches that it is advantageous to use ladder siloxane polymer in a mixture with other substances, to achieve properties, particularly dielectric constant, that differ from the properties of ladder siloxane polymer by itself. See Aoi et al. at col. 4, lines 1-23, and col. 5, lines 37-60.

Applicants note that “consisting essentially of” language “...limits the scope of a claim to the specified materials ‘and those that do not materially affect the basic and novel characteristic(s)’ of the claimed invention.” See M.P.E.P. § 2111.03. Applicants submit that the additional materials of the mixture disclosed by Aoi et al. materially affect the basic and novel characteristics of the claimed invention, particularly in light of the teachings of Aoi et al. that the mixture is used to provide properties superior to those of individual components of the mixture. Therefore, it would not have been obvious to one of ordinary skill to modify the device disclosed by Aoi et al. to provide “a first insulating film formed on an upper side of said semiconductor substrate, said first insulating film consisting essentially of ladder-shaped siloxane hydride” because Aoi et al. discloses the formation of the interlayer insulating film by mixing ladder siloxane polymer with other substances, such as silica or organic polymer, to provide improved properties, such as dielectric constant, over the properties for individual components of the mixture. Nor would one of ordinary skill in the art have had a motivation to make such a modification, particularly in light of Aoi et al.’s disclosure to use a mixture in order to provide properties superior to those of the individual components of the mixture. Withdrawal of this rejection is respectfully requested.

Claim 7 is rejected under 35 U.S.C. § 103(a) as being unpatentable as a product-by-process claim. Applicants’ understanding of the Office Action is that claim 7 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Aoi et al. as a product-by-process claim. This rejection is respectfully traversed.

Claim 7 depends upon claim 1 and is allowable over the prior art for at least the reasons noted above. Claim 7 further recites “...wherein said ladder-shaped siloxane hydride is a film being formed by being baked at a temperature within a range of from 200 degree C to 400 degree C.” Aoi et al. discloses baking mixtures of ladder siloxane polymer at temperatures of 150°C and then 450°C. See Aoi et al. at col. 10, lines 30-44, and col. 13, lines 23-40. Applicants’ specification discloses that baking ladder-shaped siloxane hydride at a temperature higher than 400°C results in a higher density than ladder-shaped siloxane hydride baked at a temperature from 200 degree C to 400 degree C. See specification at page 12, lines 12-26, and page 13, lines 1-2. Therefore, the process disclosed by Aoi et al. results in a product with different properties than the product recited by claim 7. Furthermore, it

would not have been obvious to one of ordinary skill to modify the process disclosed by Aoi et al. to provide the device recited by claim 7. Nor would one of ordinary skill in the art have had motivation to make such a modification of the process disclosed by Aoi et al.

Withdrawal of this rejection is respectfully requested.

Applicants believe that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

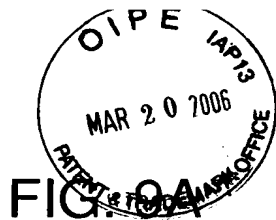
The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by a check or credit card payment form being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 19-0741.

Respectfully submitted,

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ANNOTATED SHEET
TO SHOW
CHANGES MADE

Title: SEMICONDUCTOR
DEVICE AND METHOD FOR
MANUFACTURING SAME
Inventor(s): Tatsuya USAMI et al.
Appl. No.: 10/760,554

FIG. 9A

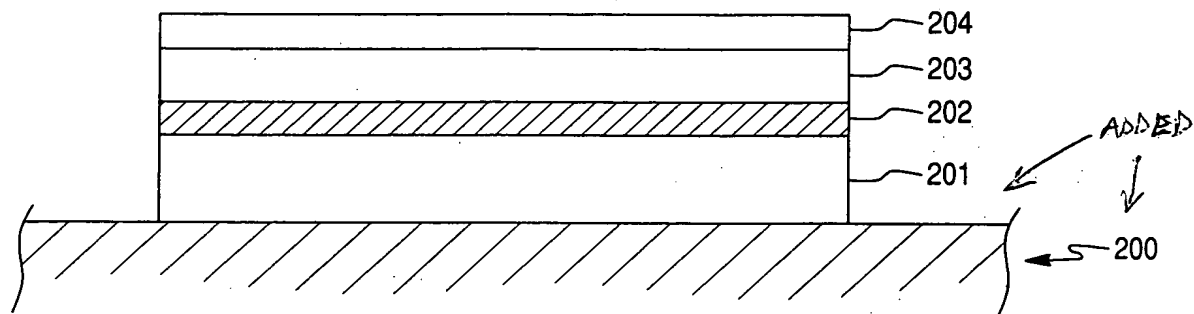


FIG. 9B

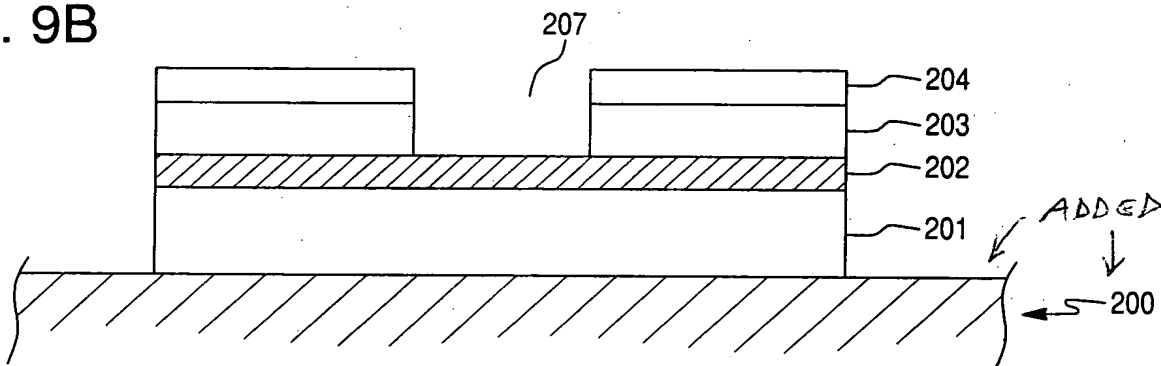


FIG. 9C

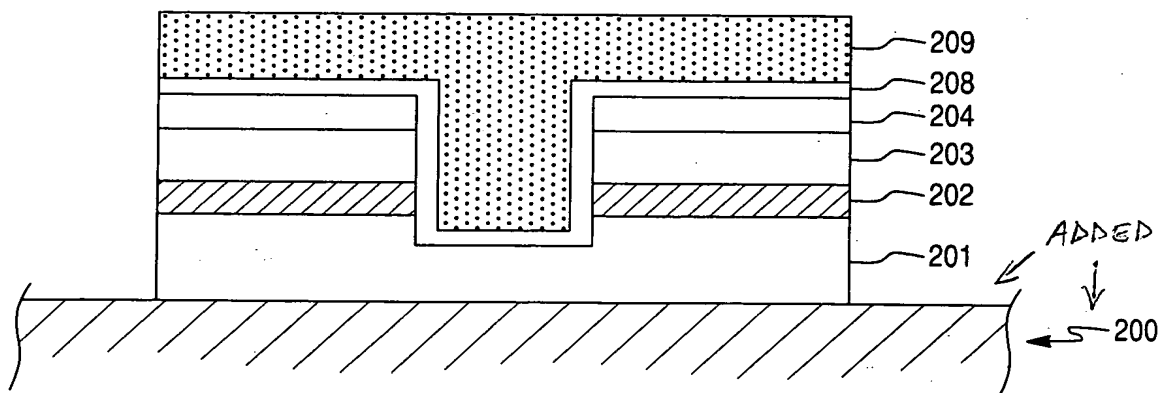


FIG. 9D

